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Desmids from southwestern Colorado

JOSEPH A. CUSHMAN

(WITH PLATE 7)

The material in which the desmid forms here noted were contained was collected in July, 1903, by Mr. Walter S. Tower. The amount of material was small and not at all rich. It was from moss growing at the edge of a small lake about a hundred yards wide, at the head of Tank Creek. This stream is a tributary of the Animas and runs into the river about six miles below Needleton, Colorado. The altitude of the lake was 3,540 meters. At this altitude, where vegetation was not at all abundant, several genera of desmids were found. None of the filamentous forms were noted, however. Several of the forms are not typical and differ from the described varieties. The following species were noted (the numbers given with each species, H. C. no. 422, etc., have reference to the numbered slides in the author's herbarium):
PENIUM DIGITUS (Ehrenb.) Bréb. in Ralfs, Brit. Desm. 150. *pl.* 25.

f. 3. 1848. (PLATE 7, FIGURE 1.)

Long. 215 μ ; lat. 65 μ . A truncate form very much like that figured by Wolle, Desm. U. S. ed. 2. *pl.* 64. *f.* 1. (H. C. no. 428.)

Penium closterioides spirogranatum var. nov. (PLATE 7, FIGURE 2.)

Long. 138 μ ; lat. 33 μ . Apices granulate, middle portion with an irregular granular spiral band connecting the apical portions. (H. C. no. 426.)

CYLINDROCYSTIS AMERICANA W. & G. S. West, Jour. Linn. Soc. Bot. 33: 281. *pl.* 18. *f.* 5, 6. 1898. (PLATE 7, FIGURE 3.)

Long. 53 μ ; lat. 25 μ . The specimen in every way fits the description and figure. The original specimen was from Ithaca, N. Y. (H. C. no. 426.)

CLOSTERIUM STRIOLATUM ERECTUM forma β Klebs, Schrift. Phys.-Oekon. Gesells. Königsberg, 22: 14, *pl.* 2. *f.* 10. 1879.

Long. 330 μ ; lat. 30 μ ; lat. apic. 15 μ . (H. C. no. 426.)

- PLEUROTAENIUM TRABECULA (Ehrenb.) Naeg. Einz. Alg. 104. *pl.* 6. *f.* A. 1849. (PLATE 7, FIGURE 4.)
 Long. 512μ ; lat. ad bas. semicell. 31μ ; lat. apic. 21μ ; lat. ad. inflat. 34.5μ . (H. C. no. 426.)
- COSMARIUM MARGARITIFERUM Menegh. Linnaea, 14: 219. 1840.
 Long. 47μ ; lat. 42μ ; lat. isthm. 15μ . (H. C. no. 426.)
 Frequent.
- COSMARIUM BOTRYTIS Menegh. Linnaea, 14: 220. 1840.
 Long. 70μ ; lat. 59μ ; lat. apic. 19.5μ ; lat. isthm. 23μ . (H. C. no. 426.)
- COSMARIUM LAEVE SEPTENTRIONALE Wille, Öfv. Vet.-Akad. Förh. 1879: 43. *pl.* 12. *f.* 34. 1879.
 Long. 18μ ; lat. 15μ ; lat. isthm. $4.5-5\mu$. (H. C. no. 422.)
 Common.
- COSMARIUM MENEGHINII BRAUNII (Reinsch) Hansg. Arch. Naturw. Landesd. Böhm. 6^o: 195. 1888.
 Long. 27μ ; lat. 21μ ; lat. isthm. 6μ . Very similar to Wolle, Desm. U. S. ed. 2. *pl.* 48. *f.* 28. 1892. (H. C. no. 422.)
- Cosmarium balteum Coloradense** var. nov. (PLATE 7, FIGURE 5.)
 Long. 77.5μ ; lat. 56μ ; lat. apic. 19μ ; lat. isthm. 18μ . Differs from the species (*C. balteum* W. & G. S. West, Trans. Linn. Soc. Bot. II. 5: 249. *pl.* 15. *f.* 1. 1896) by its smaller size, and with the central basal series represented by a single subcentral granule. (H. C. no. 454.)
- EUASTRUM VERRUCOSUM Ehrenb. Abh. Akad. Wiss. Berlin, 1833: 247. 1835; var. (PLATE 7, FIGURE 6.)
 Long. 102μ ; lat. 76μ ; lat. lob. pol. 32μ ; lat. isthm. 25μ . (H. C. no. 422.) Common.
- EUASTRUM DIDELTA Ralfs, Ann. Nat. Hist. 14: 190. *pl.* 7. *f.* 2. 1844; var. (PLATE 7, FIGURE 7.)
 Long. $110-116\mu$; lat. 43μ ; lat. lob. pol. 25μ ; lat. isthm. 15μ .
 Very much like the smaller variety figured by Wolle (Desm. U. S. ed. 2. *pl.* 33. *f.* 9), but the polar lobe is much broader. In Wolle's figure the ratio of the polar lobe to the diameter is 1 to 2.5, in the Colorado specimens 1-1.7. (H. C. nos. 426, 451, etc.) Very common.

XANTHIDIUM HASTIFERUM JOHNSONI W. & G. S. West, Jour. Linn. Soc. Bot. **33**: 299. *pl.* 17. *f.* 1. 1898; forma **longispinum** form. nov. (PLATE 7, FIGURE 8.)

Spines much longer and stouter than in the typical variety as figured by Johnson (Bull. Torrey Club, **22**: 295. *pl.* 293. *f.* 10. 1895). Often with several additional granules below the usual row. Long. s. spin. 56μ ; long. c. spin. 87μ ; lat. s. spin. 50μ ; lat. c. spin. 96μ ; lat. isthm. 14μ . (H. C. no. 454.) Common.

Xanthidium hastiferum Toweri var. nov. (PLATE 7, FIGURE 9.)

Long. s. spin. 57μ ; long. c. spin. 71μ ; lat. s. spin. 46.5μ ; lat. c. spin. 102μ ; long. spin. 23μ ; lat. isthm. 12μ ; crass. 34μ . Variety with longer spines than usual, the apical spines usually entirely wanting. Membrane smooth and without thickenings. Close to var. *inevolutum* as figured by Nordstedt (Sv. Vet.-Acad. Handl. **22**⁸: *pl.* 4. *f.* 24. 1888), but the spines are longer and stouter and the membrane is not thickened or colored in any way in the middle of the semicells, as in that variety.

This tends toward certain varieties of *X. antilopeum* but specimens were found with a trace of a rudimentary spine in the position where it would be found in typical *X. hastiferum*. The variety is named for the collector, Mr. W. S. Tower.

MICRASTERIAS ROTATA (Grev.) Ralfs, Ann. Nat. Hist. **14**: 259. *pl.* 6. *f.* 1. 1844.

Long, 270μ ; lat. 226μ ; lat. lob. pol. 60μ ; lat. isthm. 55μ . Close to the form figured by Wolle, Desm. U. S. ed. 2. *pl.* 38. *f.* 2. (H. C. no. 422.)

STAURASTRUM ECHINATUM Bréb. in Ralfs, Brit. Desm. 215. *pl.* 35. *f.* 24. 1848.

Lat. 31μ . (H. C. no. 422.)

Staurastrum Johnsoni Coloradense var. nov. (PLATE 7, FIGURE 10.)

Differs from the species (*S. Johnsoni* W. & G. S. West, Trans. Linn. Soc. Bot. II. **5**: 266. *pl.* 17. *f.* 16. 1896), in being

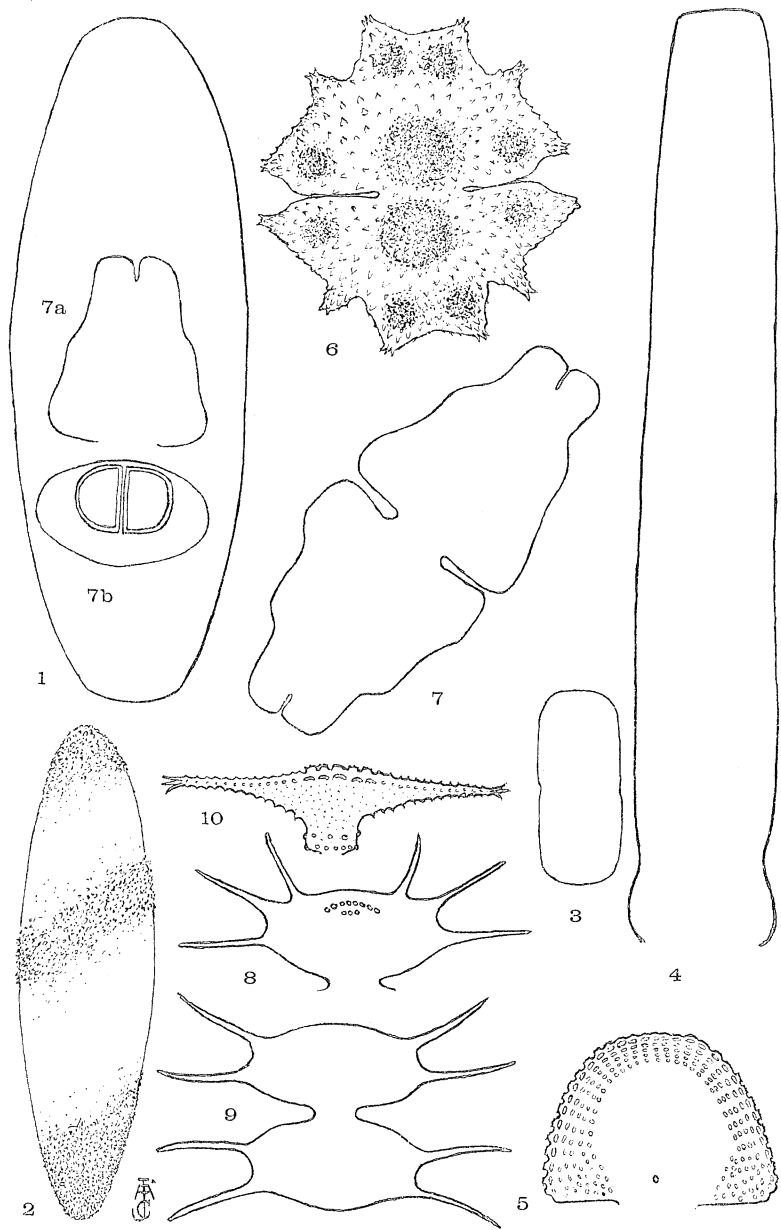
somewhat larger, with the lower side of the processes fully as rough as the upper. In this respect it is more like *S. leptocladum* Nordst., but it has the form of processes of *S. Johnsoni*, and the apices are tridentate. Long. $51\ \mu$; lat. $96\ \mu$; lat. isthm. $10\ \mu$. (H. C. no. 422.)

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Explanation of plate 7

All figures $\times 450$.

- FIG. 1. *Penium Digitus* (Ehrenb.) Bréb.
- FIG. 2. *P. closterioides spirogranatum* var. nov.
- FIG. 3. *Cylindrocystis Americana* W. & G. S. West.
- FIG. 4. *Pleurotaenium Trabecula* (Ehrenb.) Naeg.
- FIG. 5. *Cosmarium balteum Coloradense* var. nov.
- FIG. 6. *Euastrum verrucosum* Ehrenb., var.
- FIG. 7. *a*, *E. Didelta* Ralfs, var.; *b*, end view.
- FIG. 8. *Xanthidium hastiferum Johnsoni* W. & G. S. West, forma *longispinum* form. nov.
- FIG. 9. *X. hastiferum Toweri* var. nov.
- FIG. 10. *Staurastrum Johnsoni Coloradense* var. nov.



DESMIDS FROM COLORADO